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EXAMINER

KIM, CHONG R

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 09/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/449,215	SAMARA ET AL.
Examiner	Art Unit	
Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on ____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-32 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-32 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 11) The proposed drawing correction filed on ____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.	6) <input type="checkbox"/> Other: ____

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because the phrase "system is disclosed" in line 1 is improper. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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1. Claims 1, 4-6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-5 respectively, of copending Application No. 09/449,701. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1, 3-5 of the copending application cover equivalent subject matter as claims 1, 4-6 of the instant application, except for the limitation "the image workstation is configured to provide the image manager with a signal representative of the three dimensional rendering". However, it was exceedingly well known for image workstations to communicate, and therefore provide signals to an image manager. For example, the image manager of the instant application is an image server, and therefore, it would have been obvious for the image workstation to provide the image manager with a signal representative of the three dimensional rendering, since the image manager stores all relevant patient information such as ultrasound images and patient reports. Furthermore, one would be motivated to send a signal representative of the three dimensional rendering to the image manager in order to allow other image workstations access to the signal, therefore enabling the image workstation to construct a three dimensional rendering for diagnosis purposes.

2. Claims 14-19 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9-14 respectively, of copending Application No. 09/449,701. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application recites the limitation "constructing a three dimensional image file based on the two dimensional image information files" (claim 14, lines 11-12), while the copending application recites the limitation "building the rendering of the three dimensional object

based on the two dimensional information files received by the image workstation" (claim 9, lines 11-12). However, it would have been obvious to construct a three dimensional image file during the building of the three dimensional rendering, since the image workstation is a computer with a display, and it was well known for computers to construct an image file before displaying an image. Furthermore, although the claims of the copending application do not claim the limitation "communicating the three dimensional image information to the image manager", it would have been obvious to communicate the three dimensional image information to the image manager, as disclosed above.

3. Claims 23-30 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15-22 respectively, of copending Application No. 09/449,701. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application encompass the same subject matter as the claims of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 14-22, and 30 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring to claim 14, the applicant's specification does not sufficiently describe the difference between the "two dimensional image information file" in lines 2-3 and the "two dimensional image file" in line 5.

Referring to claim 30, the applicant's specification does not sufficiently describe the limitation "partial three dimensional rendering" in line 2. For examination purposes, the claimed limitation will be interpreted as a "three dimensional rendering" as disclosed on page 5, line 18 of the applicant's specification.

Claims not mentioned specifically depend from rejected antecedent claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2, 3, 7, and 13-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "three dimensional rendering" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. It is suggested that the applicant replace the phrase with "signal".

Claim 13 recites the limitation "three dimensional rendering file" in lines 1-2.

There is insufficient antecedent basis for this limitation in the claim.

Claim 14 is considered indefinite due to the inconsistent language used to describe the claimed limitations. Specifically, the claim recites "two dimensional image information files" in lines 2-3 and "two dimensional image files" in line 5. It is unclear from the claimed language which "file" is being claimed. Similar inconsistencies occur in lines 11 and 13.

Claims not mentioned specifically depend from indefinite antecedent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 6, 14, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,715,823).

Referring to claim 1, Wood discloses:

a. an image manager (10) having a plurality of inputs and outputs (figure 1), the inputs configured to receive image information signals and the outputs configured to provide image output signals, the image manager configured to store information representative of a plurality of two dimensional image slices and the output signals representative of the stored two dimensional image slices (col. 3, lines 3-29)

b. an imaging device (12) having an output coupled to at least one of the inputs of the image manager, and configured to provide an image signal (col. 2, line 62-col. 3, line 6)

c. an image workstation (100) having an input coupled to at least one of the outputs of the image manager (figure 1), and configured to receive output signals from the image manager representative of selected two dimensional image slices stored by the image manager (col. 3, lines 20-24), the image workstation configured to construct three dimensional image renderings from the two dimensional image slices (col. 11, line 63-col. 12, line 3. Note that the “sequence of spatially discrete images” in col. 12, line 2 is interpreted to mean image slices. Furthermore, the “physician” viewing the images is interpreted as being the user who is located at the image workstation.) and the image workstation having an output coupled to the image manager (figure 1, Note that the connection between the image manager and image workstation is bi-directional).

Although Wood teaches that the image workstation sends a signal to the image manager (col. 11, lines 56-63), he fails to explicitly state that the signal is representative of the three dimensional rendering. However, it would have been obvious for the image workstation to send a signal representative of the three dimensional rendering to the image manager, since the image manager stores all relevant patient information such as ultrasound images and patient reports (col. 12, lines 64-65). Furthermore, one would be motivated to send a signal representative of the three dimensional rendering to the image manager in order to allow other image workstations access to the signal, therefore enabling the image workstation to construct a three dimensional rendering for diagnosis purposes.

Referring to claim 6, Wood further discloses that the imaging device (12) is a medical (ultrasound) imaging device (col. 2, lines 63-67).

Referring to claim 14 as best understood, Wood discloses a method of producing a rendering of a three dimensional object from a plurality of two dimensional image information files, comprising:

- a. receiving by an image manager (10), a plurality of two dimensional image information files from an imaging device (12) (col. 2, line 63-col. 3, line 9)
- b. storing a plurality of two dimensional image files on the image manager (col. 3, lines 3-6)
- c. communicating selected two dimensional image information files to an image workstation (100) (col. 3, lines 17-24 and figure 1)
- d. receiving a two dimensional image information file by the image workstation (col. 3, lines 17-24).

Although Wood teaches that a three dimensional presentation is displayed at an image workstation (col. 11, line 63-col. 12, line3), he fails to explicitly state that a three dimensional image file is constructed. However, Wood teaches that the image workstation is a computer with a monitor (col. 3, lines 30-33 and figure 1). Therefore, since it was well known for computers to construct an image file before displaying an image (presentation) on a monitor, it would have been obvious to construct a three dimensional image file during the display of the three dimensional presentation at the image workstation.

Wood further fails to explicitly disclose communicating the three dimensional image information file to the image manager. However, as disclosed above, it would

have been obvious to communicate the three dimensional image information file to the image manager, since the image manager can send or receive image information from the image workstation (col. 11, lines 59-61), and stores all relevant patient information such as ultrasound images and patient reports (col. 12, lines 64-65). Furthermore, one would be motivated to send the three dimensional image information file to the image manager in order to allow the most appropriate specialist who is located at a another workstation access to the file for diagnosis purposes (col. 12, lines 3-5).

Referring to claim 17, see the rejection of at least claim 1 above.

Referring to claim 18, see the rejection of at least claim 6 above.

Referring to claim 19, Wood further discloses that the communicating step is carried out over an Ethernet connection (col. 11, line 17).

7. Claims 2-5, 7, 12-13, 15-16, and 20-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,715,823), in further view of Alvarez (U.S. Patent No. 6,370,413).

Referring to claim 2 as best understood, Wood fails to explicitly state that the three dimensional rendering may be stored by the image manager as a three dimensional rendering file.

However, Alvarez discloses an image manager (14) that stores a three dimensional rendering as a three dimensional rendering file (col. 5, lines 41-48. Note that the “viewing parameters” in line 41 is interpreted as being analogous to the three dimensional rendering, and the “bookmark” in lines 42-43 is interpreted to mean the three dimensional rendering file).

Therefore, since Wood and Alvarez are both concerned with the management of ultrasound images, it would have been obvious to modify the image manager of Wood, so that it stores the three dimensional rendering as a three dimensional rendering file as taught by Alvarez, in order to increase work-flow flexibility by allowing a user to reconstruct the three dimensionally rendered image without the need of resetting the viewing parameters each time it is viewed (Alvarez, col. 5, lines 33-36).

Referring to claim 3, Alvarez further discloses that the three dimensional rendering file may be selectively communicated to a physician using a PACS (col. 6, lines 24-29). Although he fails to explicitly state that the physician is located at an image workstation, it was exceedingly well known for physicians to utilize an image workstation when viewing images on a PACS. Therefore, it would have been obvious to communicate the three dimensional rendering file to an image workstation, in order to allow a physician located at the workstation to view the medical images for diagnosis purposes.

Referring to claim 4, although Wood teaches that the image manager includes a server for archiving medical pictures (col. 13, lines 15-16), he fails to explicitly state that the image manager includes a picture archival and communications system (PACS) server.

However, PACS servers were exceedingly well known in the art. For example, Alvarez discloses an image manager as disclosed above, that includes a PACS server (col. 6, lines 22-29).

Therefore, since PACS servers were exceedingly well known and commonly used in the art, it would have been obvious to include the PACS server of Alvarez in the image

manager of Wood, in order to provide a system that archives and communicates ultrasound images.

Referring to claim 5, Alvarez discloses an image workstation as disclosed above, that is a PACS workstation (col. 6, lines 22-29).

Referring to claim 7, Alvarez further discloses that the image manager includes a three dimensional rendering file storage (col. 5, lines 41-42 and figure 1. As noted above, the “bookmark” is interpreted to mean the three dimensional rendering file).

Referring to claim 12, Wood fails to teach that the image workstation is configured to provide a three dimensional rendering by surface rendering. However, surface rendering was an exceedingly well known technique for three dimensional rendering. For example, Alvarez discloses a three dimensional rendering by surface rendering (col. 5, lines 21-23).

Therefore, since Wood and Alvarez are both concerned with constructing a three dimensional rendering of ultrasound images, it would have been obvious to configure the image workstation of Wood, to provide a three dimensional rendering by surface rendering as taught by Alvarez, that offers the physician an enhanced view of the patient’s anatomy, more particularly viewing of arbitrary planes perpendicular to the primary exam axis (depth information).

Referring to claim 13 as best understood, Wood fails to teach a three dimensional rendering file. However, Alvarez discloses a three dimensional rendering file (bookmark) as disclosed above, that includes the parameters needed to reconstruct the three dimensional image rendering (col. 5, lines 21-25).

Therefore, it would have been obvious to include the three dimensional rendering file of Alvarez, in the image management system of Wood, in order to allow a physician to view a three dimensionally rendered image without the need of resetting the viewing parameters each time the image is viewed (Alvarez, col. 5, lines 34-37).

Referring to claim 15, see the rejection of at least claim 4 above.

Referring to claim 16, see the rejection of at least claim 5 above.

Referring to claim 20, see the rejection of at least claim 2 above.

Referring to claim 21, see the rejection of at least claim 3 above.

Referring to claim 22, see the rejection of at least claim 13 above.

Referring to claim 23, see the rejection of at least claim 2 above.

Referring to claim 24, see the rejection of at least claim 4 above.

Referring to claim 25, see the rejection of at least claim 5 above.

Referring to claim 26, see the discussion of at least claim 6 above.

Referring to claims 27 and 28, Wood discloses a medical scanner as disclosed above, but fails to explicitly state that the medical scanner is a MRI and CT imaging device. However, MRI and CT imaging devices were exceedingly well known in the art.

For example, Alvarez teaches that the imaging system can be based on MRI or CT modalities (col. 7, lines 63-65). Therefore, it would have been obvious to modify the medical scanner of Wood, so that it is an imaging device for MRI and CT as taught by Alvarez, since MRI and CT are both commonly known medical imaging modalities.

Referring to claim 29, Wood further discloses that the image workstation includes a display (element 108 in figure 1).

Referring to claim 30 as best understood, see the rejection of at least claim 29 above.

Referring to claim 31, see the rejection of at least claim 3 above.

Referring to claim 32, see the rejection of at least claim 13 above.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,715,823) as applied to claim 1, in further view of Kimura (U.S. Patent No. 4,835,688).

Referring to claim 8, although Wood teaches that the image workstation is configured to provide a three dimensional rendering as disclosed above, he fails to explicitly state that the rendering is accomplished by multi-plane reconstruction (MPR). However, multi-plane reconstruction was an exceedingly well known technique for three dimensional rendering. For example, Kimura discloses a three dimensional rendering by multi-plane reconstruction (col. 5, lines 26-30).

Therefore, since Wood and Kimura are both concerned with constructing a three dimensional rendering of medical images, it would have been obvious to configure the image workstation of Wood, to provide a three dimensional rendering by multi-plane reconstruction as taught by Kimura, that offers the physician an enhanced view of the patient's anatomy, more particularly viewing of arbitrary planes perpendicular to the primary exam axis (depth information).

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9. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,715,823) as applied to claim 1, in further view of Fox (U.S. Patent No. 5,668,846).

Referring to claims 9 and 11, although Wood teaches that the image workstation is configured to provide a three dimensional rendering as disclosed above, he fails to explicitly state that the rendering is accomplished by multi-plane volume reconstruction (MPVR). However, multi-plane volume reconstruction was an exceedingly well known technique for three dimensional volume rendering. For example, Fox discloses a three dimensional volume rendering by multi-plane volume reconstruction (col. 7, lines 15-20).

Therefore, since Wood and Fox are both concerned with constructing a three dimensional rendering of medical images, it would have been obvious to configure the image workstation of Wood, to provide a three dimensional volume rendering by multi-plane volume reconstruction as taught by Fox, that offers the physician an enhanced view of the patient's anatomy, more particularly viewing of arbitrary planes perpendicular to the primary exam axis (depth information).

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,715,823) as applied to claim 1, in further view of Cline (U.S. Patent No. 5,226,113).

Referring to claim 10, although Wood teaches that the image workstation is configured to provide a three dimensional rendering as disclosed above, he fails to explicitly state that the rendering is accomplished by maximum intensity pixel (MIP) projection. However, MIP projection was an exceedingly well known technique for three

dimensional rendering. For example, Cline discloses a three dimensional rendering by MIP projection (col. 4, lines 20-23).

Therefore, since Wood and Cline are both concerned with constructing a three dimensional rendering of medical images, it would have been obvious to configure the image workstation of Wood, to provide a three dimensional rendering by MIP projection as taught by Cline, that offers the physician an enhanced view of the patient's anatomy, more particularly viewing of arbitrary planes perpendicular to the primary exam axis (depth information).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 6,440,071 to Slayton discloses a peripheral ultrasound imaging system.

“Feature-based Interactive Visualization of Volumetric Medical Data” by Sun et al. discloses a fast display manipulation of 3-D data.

“Visualization of 3D Ultrasound Data” by Nelson discloses 3-D rendering techniques for ultrasound images.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Monday thru Thursday 8:30am to 6:00pm and alternating Fridays 9:30am to 6:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

CK
ck

September 18, 2002



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